

Analysis of youth underemployment in North Macedonia, Montenegro and Serbia

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Context- underemployment

Who is underemployed? – literature perspective

- when a worker underuses his/her skills, training and experience (Bonnal, 2009);
- working in job that is below the employee's full working capacity (McKee-Ryan and Harvey, 2011), worker who works less than 35 hours per week and wants to work more (ILO);
- Clark et al. (2010) - job insecurity as a dimension;

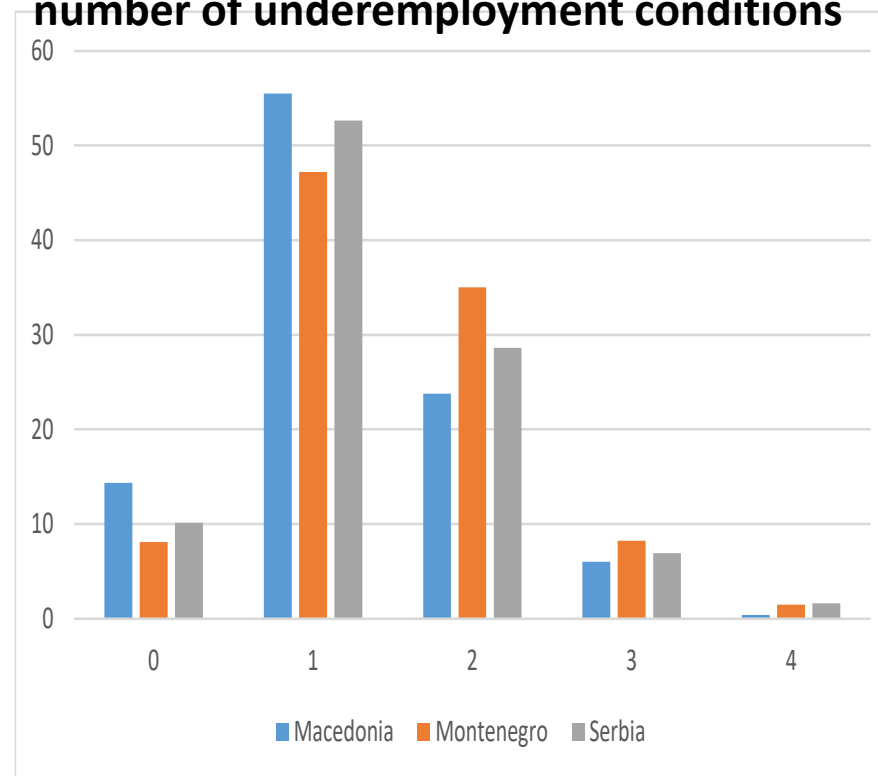
Underemployment conditions

- Work less than 35 hours and want to work more
- Temporary contracts
- Job insecurity
- Salary below the minimum
- Over-qualification

Context- underemployment

Shares in total employment	Macedonia	Montenegro	Serbia
Underemployment (15-64)	2%	1.8%	9%
Youth underemployment (15-29) – ILO definition	12.5%	14.3%	19.4%
Female youth underemployment (15-29) – ILO definition	13.9%	15.2%	24.9%
Youth underemployment (15-29) – broader definition	57.1%	68.3%	60.9%
Source: ILO (first indicator); SWTS (the other three indicators). Figures represent shares in total employment.			

Underemployment intensity by country by number of underemployment conditions



Context- policy context

Underemployment **hides a large pool of unused potential**, because these workers will likely respond to better job offers that better match their skills.

Policy relevance

- Active labour market measures

However, the issue of youth underemployment has not been studied nor tackled by policymakers.

Research objectives

Primary objectives

- to examine the determinants of youth underemployment, and
- To identify the underemployment effects on monetary wellbeing (wages) in North Macedonia, Serbia and Montenegro.

Secondary objectives

- To devise credible recommendations and specific instruments to tackle the phenomenon.

Theoretical background

Factors of underemployment

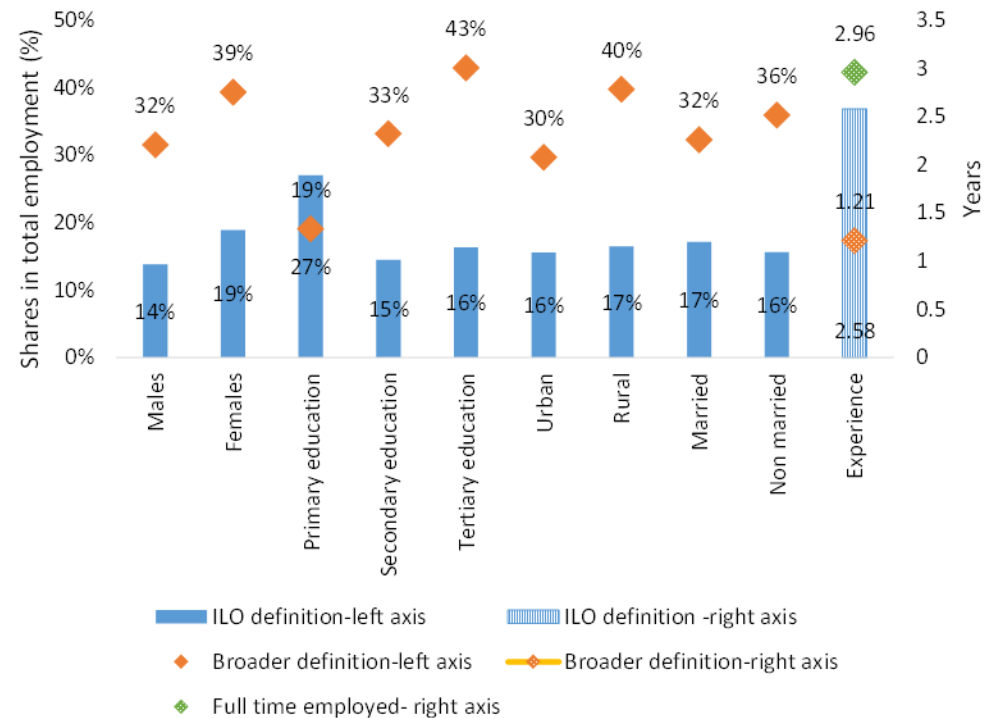
- Human Capital Theory (Becker,1962)
 - education and skills, as human-capital characteristics
 - individual's education, age, experience, gender, marital status are significant indicators in assessing the extent of underemployment (Leppel and Clain, 1988; Altonji and Paxson, 1988; Hersch, 1991; Ruiz-Quintanilla and Claes, 1996; Koeber and Wright, 2001; Gorg and Strobl, 2001; Jensen and Slack, 2003:2004; Bonnal et al. 2009)
- The most vulnerable or disenfranchised groups such as young workers, old workers, high school dropouts, and in some service and blue-collar professions (Sum and Khatiwada, 2010), Reynolds, 2012)

Underemployment and monetary welfare

- Over-education and mismatch is a real phenomenon that has important economic effects on wage inequality (Feldman et al.,2002), (Korpi and Tahlin,2009), (Pecoraro, 2014)

Stylized facts

Underemployment of youth by gender, education, location and marital status



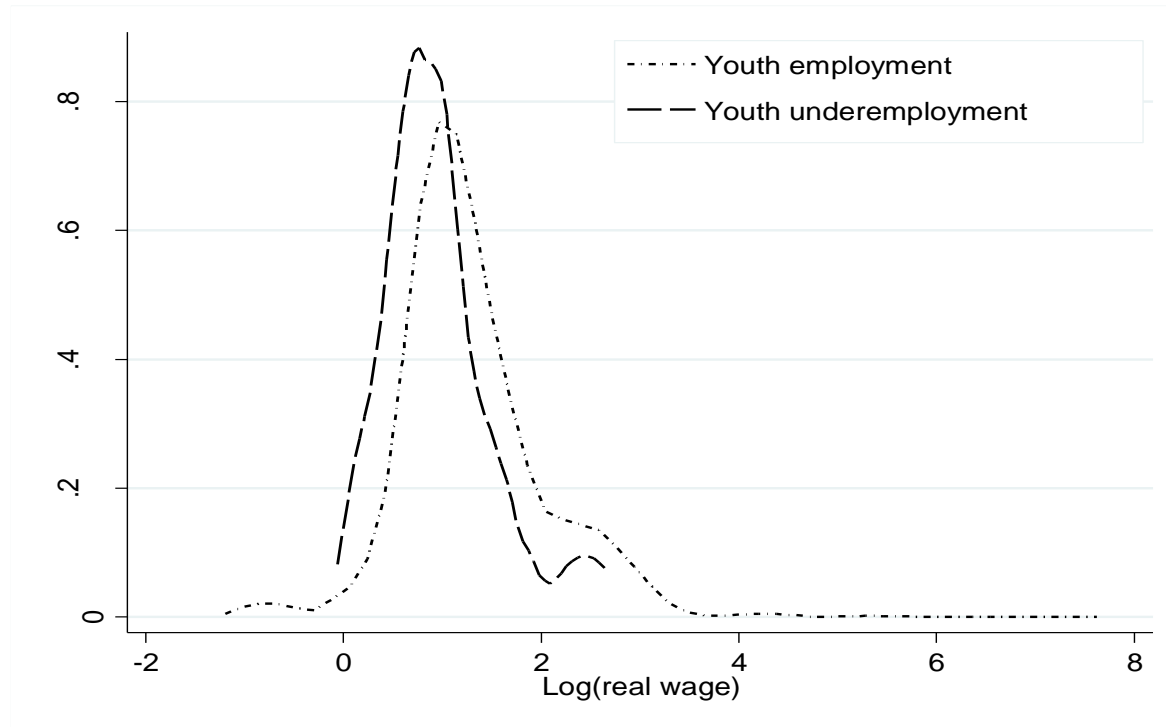
Stylized facts

Share of total employment	All three countries		Macedonia		Montenegro		Serbia	
	ILO Definition	Broader Definition	ILO Definition	Broader Definition	ILO Definition	Broader Definition	ILO Definition	Broader Definition
Agriculture	38.10	21.58	30.93	25.37	omitted	omitted	41.74	19.66
Manufacturing	8.90	34.79	7.00	39.52	9.43	26.41	9.88	32.35
Construction	10.93	32.60	12.95	29.57	4.35	65.22	9.47	34.75
Services	12.53	41.80	6.53	35.26	10.28	43.30	14.76	44.24
Intellectual services	26.28	36.68	21.33	27.10	34.14	57.37	28.79	41.54
Public	3.03	15.49		10.58	2.08	45.83	4.66	18.03
Other service activities	26.79	33.52	9.84	17.18	29.16	41.67	29.63	36.23
Occupation								
Managers	9.72	18.61	omitted	omitted	16.67	omitted	11.60	22.26
Professionals	17.23	31.54	18.23	29.59	20.63	31.38	18.63	32.79
Workers w/o agricultural workers	11.96	39.57	12.21	43.80	12.92	46.44	12.49	41.23
Skilled agricultural, forestry and fishery workers	43.21	16.45	48.67	21.14	omitted	omitted	42.32	15.67
Elementary occupations	25.52	39.35	23.54	24.78	33.33	42.86	26.85	49.26

Source: ILO School-to-Work-Transition (SWT) Surveys, 2014/2015

Stylized facts

Wage distribution by underemployment status



Data

ILO – School to Work Transition Survey: 2014 for North Macedonia and 2015 for Serbia and Montenegro

Data on various aspects of youth: demographic variables, education, household conditions, employment, inactivity status, perceptions on various aspects during the transition from school to work and so on

Youth (15-29)

3952 observations,

Individual level

Model

initial two-stage shape:

$$P(\text{underemployed}_i) = \alpha_1 + \beta_{11}\text{exper}_i + \beta_{12}\text{exper}^2_i + \beta_{13}\text{gender}_i + \beta_{14}\text{primary}_i + \beta_{15}\text{secondary}_i + \beta_{16}\text{married}_i + \beta_{17}\text{parent_edu}_i + \beta_{18}\text{sector}_i + \varepsilon_{19i} \quad (1)$$

$$\log\text{realwage}_i = \alpha_2 + \beta_{21}\text{exper}_i + \beta_{22}\text{exper}^2_i + \beta_{23}\text{gender}_i + \beta_{24}\text{primary}_i + \beta_{25}\text{secondary}_i + \beta_{26}\text{married}_i + \beta_{27}\text{parent_edu}_i + \beta_{28}\text{sector}_i + \gamma_1\text{underemployed} + \varepsilon_{29i} \quad (2)$$

Whereby:

- **Underemployed**– broader definition composed of 5 conditions - an ordered variable [0, 5]
- The **personal characteristics** included are coming from the Human Capital Theory: education, experience, marriage and gender.
- The **job characteristics** include: sector, composed of construction, market services and public sector;
- ε_i is the error term which is assumed well-behaved.
- The **wellbeing** is defined through the wage, measured by real earnings per hours in logarithm and adjusted by purchasing power parity (PPP) rate of euros;

Econometric challenges

Selection concern

- underemployment condition is observed only for employed.
- (potential) systematically different observable characteristics between:
 - employed and non-employed;
 - full time and part time employed;

Endogeneity concern

- underemployment may be endogenous to youth wellbeing.
 - Wellbeing can be both a cause and a consequence of underemployment.

Methodology

Instrumental variables approach (Bonnal et al. 2009; Korpi and Tahlin, 2009)

- a variable affecting only underemployment and not wellbeing (instrument) - regional unemployment rates
- lines of caution:
 - in the period in-between the schooling completion and employment youth migrated from one region to other, then the effect of unemployment on the wage perspectives and their wellbeing in general may be underestimated
 - unobservable characteristics of the parents

Lewbel (2012) proposed **a new method that identifies structural parameters in regression models** with endogenous or mismeasured regressors

- instruments are generated from the model data, could be used alone or together with other instruments.

Model- to be estimated

$$P(emp_i) = \alpha_3 + \beta_{51}exper_i + \beta_{52}exper^2_i + \beta_{53}gender_i + \beta_{54}primary_i + \beta_{55}secondary_i + \beta_{56}married_i + \beta_{57}sector_i + \varepsilon_{58i} \quad (3)$$

$$P(underemployed_i) = \alpha_4 + \beta_{61}exper_i + \beta_{62}exper^2_i + \beta_{63}gender_i + \beta_{64}primary_i + \beta_{65}secondary_i + \beta_{66}married_i + \beta_{68}sector_i + \gamma_2 reg_unemp_r + \sum \gamma_j internal_inst_{ij} + \varepsilon_{69i} \quad (4)$$

$$\logrealwage_{ij} = \alpha_5 + \beta_{71}exper_i + \beta_{72}exper^2_i + \beta_{73}gender_i + \beta_{74}primary_i + \beta_{75}secondary_i + \beta_{76}married_i + \beta_{78}sector_i + \gamma_4 underemployed + \varepsilon_{79i} \quad (5)$$

Whereby:

- reg_unemp_r is the regional unemployment rate at the time the individual finished schooling;
- $internal_inst_{ij}$ stands for a set of internally-generated instruments a-la Lewbel (2012)
- Estimated by conditional mixed process (CMP) estimator (Roodman, 2012)

Results- Validaty test

The validity tests of the usage of the external instrument – the regional unemployment at the time the person graduated show that the instrument is weak when is used alone

- The underidentification test is above 0 in all three countries
- montiel-pflueger robust weak instrument test shows that the instrument alone is weak

The validity of the instrumental variable and data generated instruments **changes when we combine them**

- the underidentification test shows it is 0
- The first stage F-test of excluded instruments (Joint significance) show that there is conditional heteroscedasticity, thus proving that the generated instruments explain the endogenous regressor. This is a condition that is need for using the Lewbel (2012) approach.
- montiel-pflueger robust weak instrument test shows that the method is correct since the instruments develop coefficients with maximum relative bias of less and unequal to 5%.

Results- Determinants of Underemployment Intensity

Underemployed as dependent variable	Macedonia	Montenegro	Serbia	Overall
	(1)	(2)	(3)	(4)
Experience (in years)	-0.153*** (0.051)		-0.063*** (0.013)	-0.029* (0.017)
Experience ²	0.016*** (0.006)	0.005* (0.003)		
Primary education	-1.487*** (0.224)	-0.994*** (0.294)	-0.515*** (0.153)	-0.994*** (0.303)
Secondary education	-0.363*** (0.100)	-0.483*** (0.109)		-0.273** (0.135)
Marital status (1=married)	-0.243** (0.101)		0.167* (0.090)	
Regional unemployment rate		0.008 (0.005)		-0.003* (0.002)
Labour market characteristics				
Construction sector				
Market services			0.269*** (0.078)	0.141*** (0.045)
Public sector	-0.223** (0.105)			-0.096* (0.054)
Constant	-1.906*** (0.136)	-1.625*** (0.163)	-1.454*** (0.099)	-1.657*** (0.029)
Observations	606	494	817	1,917
<p>Note: Authors' calculations. Note: *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively. Standard errors are provided in parentheses. Estimates corrected for heteroskedasticity. Ordered probit regression, estimates are removed based on 15% level of significance</p>				

Results- Wage Effects of Underemployment by Country

	North Macedonia	Montenegro	Serbia
Dependent variable wages	(1)	(2)	(3)
Underemployed	-0.143***	-0.118***	-0.078*
Individual characteristics			
Experience (in years)	0.060**	-0.049	0.012
Experience ²	-0.006**	0.001	-0.003
Gender (1=female)	0.085	-0.127	-0.039
Primary education	-0.128	-0.513***	-0.355***
Secondary education	-0.261***	-0.255***	-0.048
Marital status (1=married)	0.004	0.620	0.187**
Parents education	-0.033	-0.057	0.169***
Labor market characteristics			
Construction sector	0.117	-0.157	-0.186**
Market services	0.017	0.239**	-0.037
Public sector	0.181*	0.026	0.340**
Constant	1.396***	1.909***	1.203***
Observations	304	240	520
Instruments' tests			
Under-identification test (Kleibergen-Paap rk LM p-value)	0.000	0.000	0.000
Montiel-Pflueger robust weak instrument test—F stat	313.622 </ 21.58 (τ=5%)	322.782 </ 21.58 (τ=5%)	710.478 </ 21.58 (τ=5%)
First stage test of excluded instruments (Prob > F)	0.0000	0.000	0.000
Hansen J statistic (p-value)	0.145	0.082	0.456
Note: Authors' calculations.			
Note: *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively. Standard errors are provided in parentheses. Estimates corrected for heteroskedasticity.			
†—2 Step Generalized Method of Moments (GMM)			

Conclusion and policy recommendations

Main conclusions

- Underemployment intensity lowers wages for 14% in North Macedonia, 12% in Montenegro and 8% in Serbia
- Underemployment intensity significantly negatively influences youth wages in all three countries

Main policy recommendations

- Early interventions of various types in the secondary, but also primary education;
- Provide career counselling for youth who expressed they were over-qualified;
- Skill certification;
- Promoting VET schools and motivating youth for high-skill occupations

Thank you !

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